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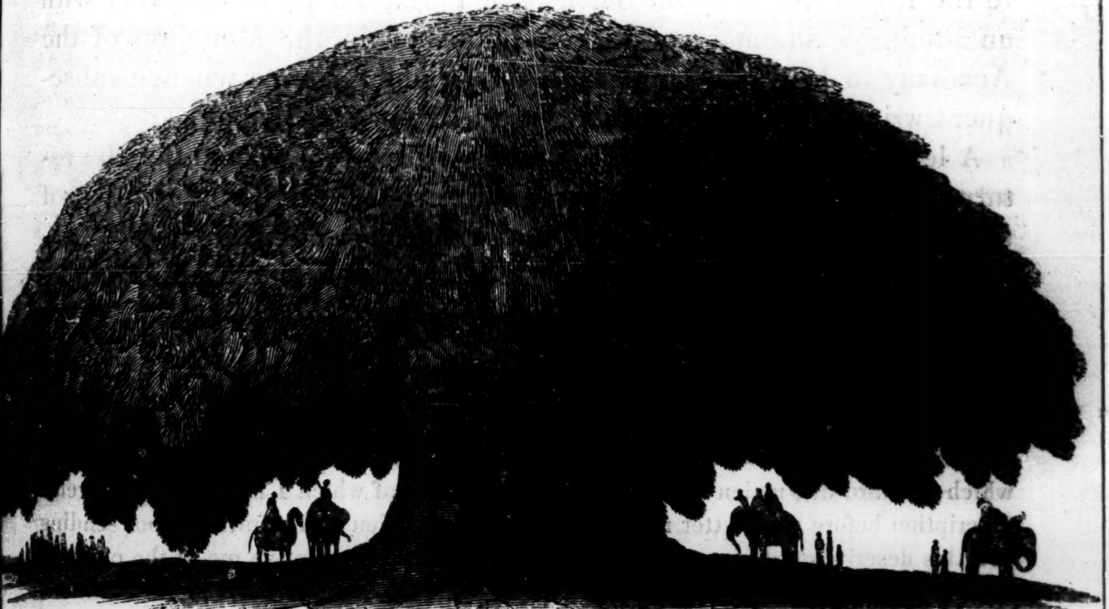
Art. CVII. — *Notes on the Baobab Tree, (Adansonia digitata).*

By George Luxford, A.L.S., &c.



THE BAOBAB.

Egyptian Sour Gourd. Monkey's Bread.

Baobab, Bauhin, Hist. i. 110.
Adansonia Baobab, Linn. Sp. Plant. 960.
Adansonia digitata, Linn. Syst. Veg. 620.

Group.—Syncarposæ. Alliance.—Malvales.
Natural Order.—Sterculiaceæ. Section.—Bombaceæ.
Linnæan Class and Order.—Monadelphia Polyandria.

Having received from a correspondent a copy of the 'Bombay Monthly Times for June, 1842,' which contains some interesting particulars relating to the Baobab-tree of Senegal, as observed in India, it has occurred to me that a few notes on this "colossus of the vegetable kingdom," even if they contain nothing new, may not be out of place in the pages of 'The Phytologist.'

The Baobab is a native of Senegal and other parts of the western coast of Africa, from the Niger to Benin, "a part of the world," says Adanson, "which has always been justly looked upon as the mother of monsters." This celebrated French naturalist resided in Senegal for about five years, and was probably the first botanist who had the advantage of studying the Baobab in its native country. In 1756 M. Adanson communicated a very full account of this remarkable tree to the Royal Academy of Sciences at Paris; his paper, together with an admirable summary of it, were published in the Memoires of the Academy in 1761, and appear to be the chief source whence subsequent writers have derived their knowledge of the Baobab.

A letter from Adanson to Linnæus, written four years after the return of the former from Senegal, and previously to the publication of the memoir mentioned above, contains the characters of his new genus, and several remarks upon it; the following is an extract from this letter, which is printed in the 'Correspondence of Linnæus and other Naturalists,' ii. 467.

> "Paris, Oct. 2, 1758.
>
> "Among numerous new observations in natural history which I have formerly communicated to the *Académie des Sciences*, is a complete description of the *Bahobab*, which Bernard de Jussieu has named *Adansonia*, and of which I had long ago given a description before your letter reached me. B. de Jussieu had refrained from sending you this description during my absence, that he might not deprive me of the opportunity of giving you pleasure. I therefore now send the essential parts of the character which you ask for, taken from the Memoirs of the Academy intended for publication, or rather from my own Latin manuscripts, according to the plan of your *Genera Plantarum*, as I mean to give them to the public.
>
> "ADANSONIA.
>
> "*Calyx*. Perianth simple, of one leaf, cup-shaped, divided half way down into five revolute segments, deciduous. [Fig. *c*].
>
> "*Corolla*. Petals five,* nearly orbicular, ribbed, revolute, united by their claws to the stamens and to each other. [Fig. *b*].
>
> "*Stamina*. Filaments numerous (about 700), united in their lower part into a conical tube, which they crown at the top, spreading horizontally.—[Fig. *d*.] Anthers kidney-shaped, incumbent.
>
> "*Pistil*. Ovary nearly ovate. Style very long, tubular, variously twisted. Stigmas from 10 to 14, prismatic, shaggy, spreading from the centre.

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* In Adanson's figure of the flower, of which fig. *b* at p. 436 is a fac-simile, four petals only are shown; in his separate figure of the corolla there are five petals, which is the normal number.

"*Pericarp.* Capsule oval, very large, woody, not bursting, internally separated into from 10 to 14 cells, filled with dry pulp and with seeds; the partitions membranous and longitudinal. [Page 437.]

"*Seeds* numerous, almost bony, kidney-shaped, lodged in friable pulp.

"Hence you may perceive how much this genus differs from the rest of the mallow tribe. First, by the calyx falling off immediately after flowering; — second, by the number and situation of the filaments at the top of a monadelphous tube; — third, by the number and form of the stigmas; — fourth, by the woody and close capsule, with its pulp and cells; — fifth, the compound fingered leaves; — and sixth, by the tree itself, which of all hitherto discovered is the most prodigious in the size of its trunk and branches, being as it were the stupendous vegetable monster of Africa. This tree is found in the country of Senegal only, from whence its fruit, with that of the *Agilhaid*, is sent every year, as an article of commerce, to Egypt. Some of its seeds having been planted there, in a garden, one or two trees were raised, which appear, from Prosper Alpinus, to have attained no remarkable size, nor perhaps to have flowered, if we may judge by the figure in that author, which in every particular, except the fruit, is erroneous. In the West Indian island of Martinico, a single tree of this kind, already full grown, bearing flowers and fruit, is carefully preserved. It was formerly sown there by the negroes. These and similar remarks are detailed, with my authorities, in the communications to the Parisian Academy."

In the above extracts allusion is made to the immense size of this tree, which has been spoken of as the largest (or rather the broadest) in the world, a title it well merits, as will be seen from the following description.*

The Baobab has more the appearance of a forest than of a single tree. It is an immense hemispherical mass of foliage, sixty or seventy feet high, and from a hundred and twenty to a hundred and fifty feet in diameter. The main trunk is very short in proportion to its size, being only about ten or twelve feet high; while it is at least twenty-five feet in diameter. Golberry, in his Travels in Africa, mentions a Baobab the trunk of which measured upwards of thirty-four feet in diameter, and was about thirty feet high. The branches are of considerable size, and fifty or sixty feet long; the central branch rises perpendicularly, the others spread around it in all directions, the low-

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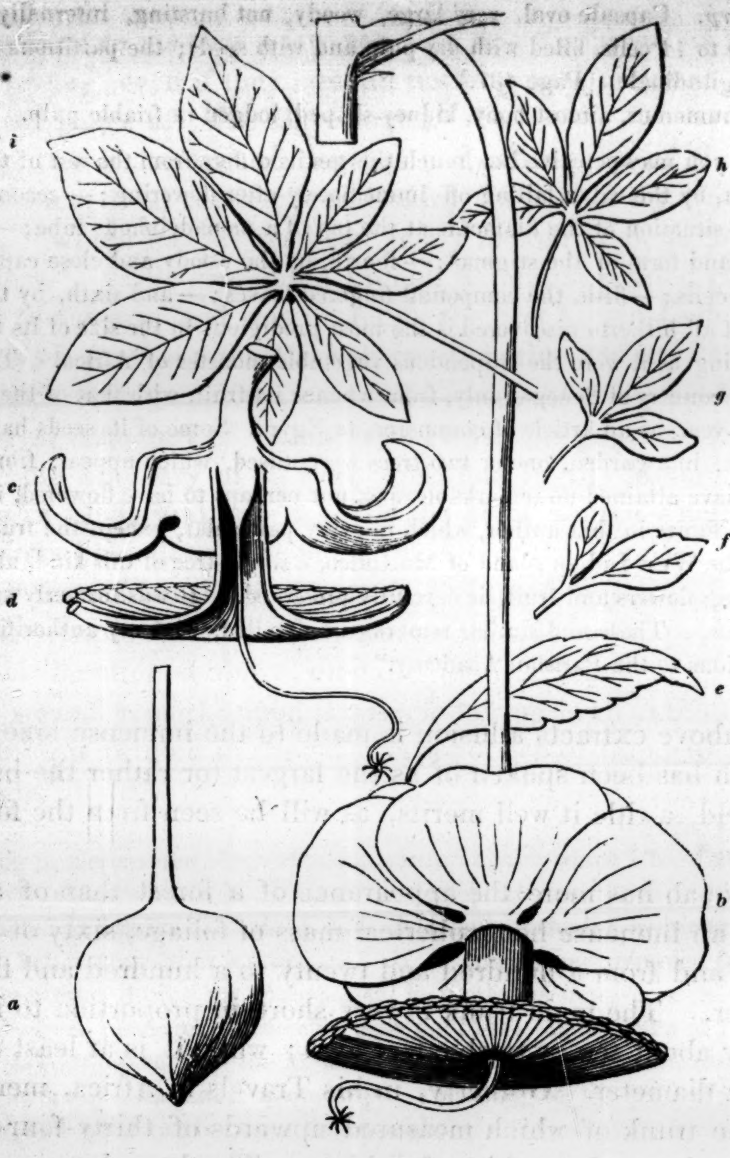
* The Norfolk-Island Pine (called *kauri* by the New Zealanders) occasionally grows to a large size. Mr. Terry, in his lately-published work on New Zealand, mentions an extraordinary individual which grows on the eastern coast, near Mercury Bay, which is the largest in New Zealand. "It is called by the natives the Father of the Kauri. Although almost incredible, it measures seventy-five feet in circumference at its base. The height is unknown, for the surrounding forest is so thick, it is impossible to ascertain it accurately. There is an arm some distance up the tree, which measures six feet in diameter at its junction with the parent trunk." It is evident that the particular tree here spoken of, far exceeds the average size of the species.



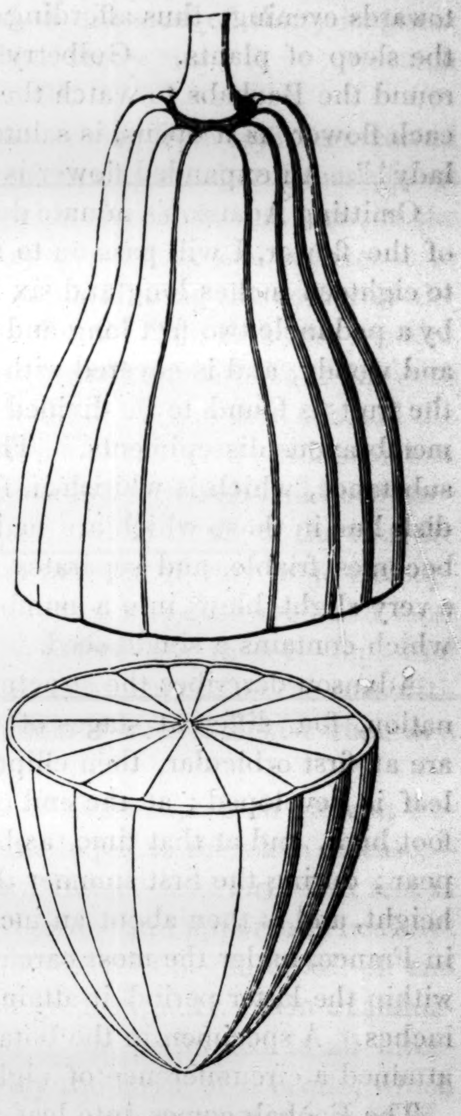
Flowers and leaves of the Baobab.

a. Flower-bud before expansion. **b.** Expanded flower. **c.** Section of the calyx. **d.** Section of the stamens. **e, f, g, h, i,** Leaves from trees of different ages.

er ones being nearly horizontal for the greater part of their length, while the extremities frequently trail on the ground, from their own weight. The roots are much longer than the branches. The central root descends perpendicularly to a great depth; the lateral ones extend horizontally, and are sometimes but a short distance below the surface of the ground. Adanson saw one of these roots, of which a great portion had been laid bare by the waters of a river; the uncovered part measured about one hundred and ten feet, and judging from its size he considered that forty or fifty feet might be still hidden.

The bark of the trunk and older branches is about nine lines thick, of an ash-grey colour, smooth to the touch, and having a shining appearance, as if varnished; that on the younger branches is greenish and somewhat hairy. The wood is soft, white, and extremely light, being very little heavier than cork. In the Bombay Monthly Times are given the results of carbonizing seven different sorts of wood, including that of the Adansonia. The weight per cent. of charcoal yielded by each is as follows.—Adansonia, 33; lignum vitæ, 26·4; mahogany, 25; oak, 22; beech, 19; ash, 17; Scotch fir, 16: so that the lightest wood presents the anomaly of yielding 6·6 per cent. of charcoal more than the heaviest.

The leaves are very similar in general appearance to those of the horse-chesnut, being somewhat orbicular in outline, and divided into several elliptical lobes, which are entire at the margin, and vary in number from three to seven. They are alternate, and supported by a petiole, at the base of which are two small stipules; these are said by Adanson to fall off as soon as the leaves expand; they are, however, represented in his figure. The leaves of very young trees are undivided and nearly sessile; the digitated leaves first make their appearance when the young plant is about a foot high. The figures *e*—*i*, on the opposite page represent the different forms of the leaves; the lobes of the fully developed leaves (*i*) are from four to six inches long and two or three inches wide.



Fruit of the Baobab.
The lower section shows the arrangement of the carpels.

The flowers of the Baobab, as might be expected from the size of the tree, are very large. The flower-bud (fig. *a*) is globose, and nearly three inches in diameter; when fully expanded the flowers are usually about six inches in diameter. There are generally two or three of these flowers on a branch, each being suspended by a peduncle which springs from the axil of one of the lower leaves, and bears a few scattered deciduous scales or bracts. The peduncle is a foot long and four lines thick. The handsome white flowers, like those of many allied plants, expand in the morning, about sun-rise, and close towards evening, thus affording an example of what Linnæus terms the sleep of plants. Golberry observes that the negroes assemble round the Baobabs to watch the expansion of their flowers; and that each flower, as it opens, is saluted with—"Good morning, beautiful lady!" An expanded flower is shown at *b*.

Omitting Adanson's minute description of the calyx and other parts of the flower, I will pass on to the fruit (p. 437), which is fromtwelve to eighteen inches long and six inches in diameter, and is suspended by a peduncle two feet long and nearly an inch thick. It is very hard and woody, and is covered with a greenish down. When cut across the fruit is found to be divided into from ten to fourteen cells by membranous dissepiments. The seeds are embedded in a spongy substance, which is whitish in fresh and healthy fruits, and of a reddish hue in those which are badly formed or very old; as it dries it becomes friable, and separates, either spontaneously or on receiving a very slight blow, into a number of irregular polyhedrons, each of which contains a single seed.

Adanson describes the structure of the seed and its mode of germination, four different stages of which are figured. The cotyledons are at first orbicular, then elliptical; on the fourth day the first true leaf is developed; at the end of a month the young tree is about a foot high, and at that time, as before stated, the digitated leaves appear; during the first summer the tree increases to about five feet in height, and is then about an inch or an inch and a half thick, whilst in France, under the most careful treatment, the author observes that within the latter period it attains no greater height than about twelve inches. A specimen in the botanic garden at Calcutta is said to have attained a circumference of eighteen feet in twenty-six years.

The Baobab comes into leaf in June, flowers in July, matures its fruit in October and November, and in the latter month it loses its leaves. It is very common both in the Island of Senegal and at the Cape de Verd, and along the sea-coast to Sierra Leone, and is even met with at Galam, which is more than a hundred leagues from the sea. M. Golberry says that in the year 1786 he "saw the greatest number of Baobabs on the isthmus of the peninsula of Cape de Verd, between the bay of Jof and that of Dakar," a space of nearly two square leagues, where there were at least sixty trees. The roots penetrate rocky soils with great difficulty, and if ever so slightly injured they decay; this decay is soon communicated to the trunk, where its progress is very rapid and the tree quickly perishes. Hence it thrives best and is most abundant in wet shifting sands, such as those which extend from Senegal to Cape de Verd, a distance of thirty leagues; while at Galam, where the soil is a hard stony clay, it occurs much less frequently and is comparatively small.

Besides a general rottenness or decay arising from injuries received by the root, this tree is occasionally subject to another disease, most probably produced by a fungus somewhat similar to that causing the dry rot, which spreads through the woody portion, and reduces it to the consistence of the pith, without either altering the colour of the wood or changing the disposition of its fibres. The bark also remains uninjured, and there is nothing in the external appearance to indicate the operations of the insidious enemy within. When thus affected the tree is frequently unable to resist the force of the wind; Adanson met with one in an island near Senegal, the trunk of which had been broken asunder in the middle during a gale. The trunk, at the time he saw it, was inhabited by an immense number of very large Coleopterous larvæ. The disease by which the tree was destroyed had most probably made considerable progress before the insects deposited their eggs in the trunk; at all events we know this to be the case with willows and other trees, which are seldom if ever attacked when in a sound and healthy state.

The rapid decay of a fine specimen of this tree, which grew at Colabah in Bombay, is doubtless to be attributed to the same disease.—This tree—one of the finest in western India—was forty-four feet in circumference. In May 1840, it was vigorous and apparently healthy; a few months after that time the large branches began to fall off and the ravages of disease proceeded with great rapidity. On examination the decayed portions were found to be perforated in all directions, like the one seen by Adanson, by the larvæ of a beetle, which were reducing the whole to a powder resembling saw-dust. Both the larva and the perfect insect are figured in the Bombay Times. The former is described as being two and a quarter inches long, and three inches in circumference at the thickest part. Some idea of the ravages of these larvæ may be formed from the statement, that a piece of the tree three feet long and eight inches in girth, apparently healthy and sound, was found to be so thoroughly perforated that scarcely two inches of solid wood could be found entire.

We have heard such astounding statements respecting the longevity of this tree, that it would not be right to pass over the subject quite without notice. In the Bombay Monthly Times before referred to, are some interesting notes furnished by the Rev. Dr. Wilson, who remarks that —

> "This tree seems to be associated with absurdity among the sages of the West as well as the East. 'The Baobal-tree of Senegal,' says Lyell in his 'Principles of Geology,' 'is supposed to exceed almost any other in longevity; Adanson inferred that one which he measured, and found to be thirty feet in diameter, had attained the age of 5150 years. Having made an incision to a certain depth, he first counted three hundred rings of annual growth, and observed what thickness the tree had gained in that period. The average rate of growth of younger trees, of the same species, was then ascertained, and the calculation made according to a supposed mean rate of increase.' Now, how does the matter stand, with regard to the specimens we have before us in India? Dr. Roxburgh tells us that the tree is an *exotic* in this country — and he is quite correct. It was introduced by the Portuguese from Mozambique within the last three hundred years; and in many instances it has already attained to a growth *exceeding* that specified by Adanson and Lyell. Dr. Lindley has shown that what are called the annular [? annual] rings, are not to be depended upon in calculations as to the age of trees; and that with reference to this very extraordinary species."—Extracts from Notes of a visit to Dwaraka, by the Rev. Dr. Wilson.

There is no doubt that the Baobab lives to a very great age, as may be inferred from its enormous bulk. Adanson's observations on some trees which he met with in one of the Magdalen islands, led him to the conclusion that they were growing there at the time of the deluge, consequently that they were, at the time he saw them, upwards of five thousand years old! On these trees were carved some European names, some of which were distinctly dated in the fifteenth and sixteenth centuries, others less distinctly bore date in the fourteenth. Adanson thought it probable that the same trees were seen by Thevet when he passed these islands in 1555, on his voyage to the antarctic regions. The letters of the names were six inches high, and the names themselves occupied a length of about two feet, or somewhat less than the eighth part of the circumference of the trunk. Reasoning from these facts, and from his own observations of the rate of growth of the tree, Adanson arrived at the conclusion above stated, which is most probably an erroneous one. The same trees were seen by Golberry, thirty-six years after Adanson was on the island; he says that the words of the inscription were Dutch, and that one of the dates was 1449.

When I first read Adanson's account of the Magdalen-island Baobabs, I could not help suspecting that their size was incorrectly given, a circumference of sixteen or eighteen feet appearing to bear no proportion to the enormous age assigned to them. But on turning to the narrative of his voyage, prefixed to the 'Natural History of Senegal,' p. 66, I find that the diameter of the trees is expressly stated to be six feet. The author says that the names were deeply engraved in the bark, and that each person of the party, except himself, added his mark to those previously on the trees, but that he was satisfied with renewing two of the names which were old enough to be worth the trouble, one of them being dated in the fifteenth the other in the sixteenth century. Then follow the size of the letters, and a brief summary of the same arguments relating to the age of the trees which are afterwards given in detail in the Memoir published by the Academy. But be it observed, that neither in the Narrative nor in the Memoir does Adanson say one word about his having made an incision in the trunk and counted the number of annular layers of wood, in order to determine the age of the tree; his arguments are founded solely on the observed annual rate of increase of young trees in height and diameter, and his data are given by Sir W. J. Hooker, in the 'Botanical Magazine,' 2791-92, where the flower, fruit and leaf are beautifully figured.

The following remarks by a correspondent of the Bombay Monthly Times bear directly on the questions of the age of the tree and of its native country.

"I find you make no mention of the Adansonia digitata obtaining great perfection in the ruins of Mandoo and its environs, of which I remember once to have descanted in our evening conversations; indeed I believe these are the only localities in the upper parts of India, where the 'Khorassan Eemlee' as it is there called, is to be found in great numbers and of enormous girth.

"From Nalcha to the Delhi gate of Mandoo, a distance of six miles along the Vindyah, the road on either side is lined with the ruins of palaces, mosques and tombs, mingled with innumerable groups of the Adansonia digitata, the same extending in a long avenue from thence to the Jumna Musjid in the centre of the city, from whence they diverge to the royal parks and gardens.

"The Mahometans fondly treasure this tree as a relic of Moslem sovereignty, believing it to have been brought by the northern conquerors to embellish their imperial residences in the east; and moreover, that it languishes and dies in any Indian soil but that favoured as the abode of royalty. Sooner therefore would they lose an arm than a branch from this boasted tree, although its insidious inroads have done more to complete the ruin of Mandoo, than either the hand of time or Rajpoot bigotry; rooting itself in every crevice of the walls and roofs, and uptearing with its giant arms enormous masses of masonry. * * That the tree appears to be one to which the natives of India seem to attach much importance, is evident from both Hindoos and Mussulmen considering it in a sacred character: this probably proceeds from its prodigious size and comparative scarceness, as it is evident the Mahomedans have no claim to its importation from Khorassan, as I am credibly informed by travellers from thence there is scarcely a tree in that region attains a tithe of its size."

Adanson considers the Baobab to be indigenous nowhere but in those places on the western side of Africa which have been mentioned above; and states that the negroes, wherever they go, are in the habit of carrying with them the seeds of such plants as they make use of in cooking, or for other purposes. He enumerates many of these plants, among which are the Baobab, two kinds of cotton, the tamarind, several sorts of beans, the water-melon, &c., and observes that all these are now found in America, where they have every appearance of being indigenous, although many of them have not received American names. In support of his opinion that the Baobab is a native neither of the American continent nor of any of the West-India islands, he cites the works of Plumier, Sloane and Browne, in which it is not mentioned. He also observes that M. Thiebault de Chanvalon, an inhabitant of Martinique, speaks of a single tree growing on the island, as being the only one he had ever seen in that region. This was a young tree at the time Adanson received his information from M. Thiebault, although it had then, for some years, borne flowers and fruit. Dr. Roxburgh does not consider it to be indigenous in India, where he says it is scarce and of small size, observing that a few only have been found of any size at Allahabad, Masulipatam, on the coast of Coromandel, and in Ceylon. After reading Adanson's remarks on the custom of the negroes in transporting the seeds of the Baobab, it is not difficult to account for its introduction into Asia, and other parts of the world where it is now met with.

As a genus Adansonia seems to be chiefly distinguished from Bombax (whose habit it has, and to which Linnæus and Cavanilles say it is too nearly allied) by its deciduous calyx, its numerous stamina and its smooth shining seeds, those of Bombax being downy or woolly.—Among other and more obvious marks of agreement with other genera of the alliance Malvales, such as the extreme lightness of its wood, the large and handsome flowers, &c., may be mentioned that of the pollen grains being round and covered with minute points, as in our common Mallows. From the position of the Baobab in the system, we should expect to find its properties similar to those of its natural allies the Malvaceæ; and the various uses made by the negroes of the different parts of the tree confirm this expectation. The mucilaginous emollient quality common to the tribe, resides principally in the bark and leaves; these are dried in the shade, in a free current of air, then reduced to a powder of a beautiful green colour and nearly tasteless; this powder is kept in a dry place in calico bags, and is called *lalo.* The negroes make daily use of the *lalo* in their food, for the purpose of keeping up an abundant perspiration and cooling the blood. Adanson and one of the French officers who accompanied him, made use of the *lalo* rather freely, and to it he attributes their preservation from the ardent fevers so prevalent in Senegal during September and October. The author particularly mentions the year 1751, the autumn of which year was more than usually unhealthy in Senegal, and states that himself and his friend were the only persons of the party who were able to follow their usual avocations, all the other officers being confined to their beds. The fruit of the Baobab appears to be as useful as the leaves; in a recent state its flesh is slightly acid and of an agreeable flavour, and its juice, mixed with sugar and water, forms a refreshing beverage in putrid and pestilential fevers. The fleshy envelope of the seeds, when dry, is reduced to an impalpable powder; P. Alpinus says it was sold in his time as a medicine, under the improper name of *terra sigillata*, or Lemnian earth. Monkeys are said to feed on the seeds; these are about the size of a bean, shining, and of a brownish colour, and are made into necklaces by the negroes. The shell of the fruit, and even the fruit itself when spoiled for eating, is burned, and the ley obtained from the ashes, boiled with rancid palm oil, forms an excellent soap.

Our author concludes his account of the various uses made of the Baobab, with the following singular narrative. It has been previously stated that the roots of such trees as grow in stony ground are liable to injury, and that in consequence their trunks decay and become hollow. The negroes take advantage of the cavities thus formed, and shape them regularly into chambers, or rather vast caverns, wherein they deposit the bodies of those whom they deem unworthy to receive the ordinary rites of burial. Of this class are persons called *guiriots*; these are the poets, musicians and players, of both sexes, who are hired to preside over and assist at dances and other entertainments, to which they impart much life and spirit by their buffooneries. The negroes regard these people, while living, with a kind of superstitious awe and reverence, but no sooner are they dead, than such feelings give place to horror and contempt; the natives then neither allow their bodies to be buried in the earth nor cast into the waters, imagining that if thus disposed of, the fish in the latter would be destroyed, and that the former would produce no food. By way of averting these evils the bodies of the guiriots are suspended within the hollow trunks of the Baobab, the entrances to which are closed with planks, and there, without being embalmed, they quickly dry up and become converted into a kind of mummy.

But it appears that the Baobab is not exclusively appropriated as a receptacle of the dead; the one measured by Golberry was hollow, and used as their hall of assembly by the inhabitants of the valley of Dock-Gagnack. The entrance was seventeen feet high, and faced a lake; the height of the cavity itself was twenty feet and its diameter twenty-one. The negroes had ornamented the sides of the doorway and the interior of the cavern with rude sculptures in relief. The party pitched their tents by the side of this tree, and M. Golberry was so well pleased with the chamber, that he ordered his bed to be placed within it, intending to pass the night there. This however caused so much dissatisfaction among the natives, that he abandoned his intention, although the chiefs would not have prevented him from carrying it into effect. He states that he had no occasion to repent his forbearance, having been afterwards treated with the greatest kindness by the natives.

In Dr. Wilson's notes above alluded to, it is mentioned that he visited one of these trees in India, which the Bairagees whom he found sitting in its shade told him was the only one in the world, and requested him to take off his shoes as he approached it, an honour which himself and party declined paying. He was informed that several devotees nightly took up their quarters in the hollow trunk of this tree.

It is also stated that in South America the natives hollow out the trunk of the Baobab and use it as a habitation, and that the tree thus hollowed continues to grow and flourish so long as the sap-wood and bark remain. The wild bees of Abyssinia are also reported to deposit their honey in this tree; and that the honey stored therein is the best in the country.

Dr. Alex. Gibson, in the Bombay 'Medical and Physical Transactions,' states that at Goozerat, where grow many fine specimens of the Baobab, the fishermen use the fruit as a float for their nets, and that logs of the very light wood are also employed by them as a catamaran or raft in fishing or duck-catching.

Adanson observes that in Senegal the Baobab has almost as many names as there are kingdoms. The Oualofes call the tree *Goui* and its fruit *Boui;* the French call the tree *calabassier*, and the fruit *monkeys' bread*, (*pain de singe*). Prosper Alpinus, the first botanist who wrote of this tree, says that a fruit called *Baobab* was brought from Ethiopia to Grand Cairo; from his description, and from the notes of his commentator, Wesling, there is no doubt of this fruit being that of our tree, although, as Adanson observes, the fruits seen by Alpinus must have been small and in a bad state, being probably such as are used at Senegal for no other purpose than making soap. The author considers the figure given by Alpinus to have been drawn from imagination, but remarks that Clusius contented himself with representing only what he saw. Clusius says that he received the fruit under the names of *abavo* and *abavi*, from persons who had it from English sailors returning from Ethiopia, or rather from the coast of Guinea or Senegal: he also says that the Portuguese call the fruit *calebacera*. Scaliger gives a very short description of the fruit, brought from Mozambique under the name of *guanabimus*. After stating that all the above-named authors are cited in Bauhin's Pinax, Adanson observes that M. Lippi's manuscript remarks ought not to be passed over in silence. This learned traveller, who was the victim of a voyage into Abyssinia, undertaken by order of Louis XIV. during a period of tumult and revolution in that country, gives a much more accurate description of the fruit of the Baobab, which he saw at Cairo, whither it had been brought from Upper Egypt, than any author who had preceded him. After a warm eulogium on M. Lippi, Adanson concludes his admirable memoir by stating that it is evident, from the passages quoted, that the authors cited were acquainted only with the fruit and leaves of the Baobab, but that they had no knowledge of its flowers or of the tree which bore them, the monstrous size of which presents a fact the most remarkable which the history of Botany and perhaps that of the world can furnish.

GEO. LUXFORD.

65, Ratcliff Highway,
December 17, 1842.

ART. CVIII.—*Note on the Sands of Barry, and on Equisetum variegatum.* By MR. J. B. BRICHAN.

I HAD lately an opportunity of examining the locality named above, and as Equisetum variegatum there assumes a somewhat different appearance from that which it presents on Deeside, the few remarks I have to offer will form an appropriate sequel to my paper on the three allied Equiseta, (Phytol. 369). Whether or not the spot in which I found the plant is the same in which it was found by Don, I am unable to say; having no guide and no information, I rather stumbled upon it than searched it out, and though I went over a considerable space, I detected it only in one spot. As the locality is in various respects interesting, I may be pardoned for occupying a few sentences in particularly describing it.

A considerable part of the parish of Barry, containing from six to ten square miles, is a low sandy flat, which, at some remote period, undoubtedly lay under the sea, and is still very little elevated above its level. The links and sands, which compose the southern portion of this flat, are diversified by numerous sand-hills and knolls, which increase in size towards the south-east, and there terminate in a large sandy ridge, probably about 100 feet above the level of the sea. The smaller ones are covered with grasses, mosses, Carices &c., especially with Ammophila arenaria (*Scotticé* bent), which covers also the larger hills and part of the higher ridge already mentioned. Towards that ridge the sand-hills are rather crowded, but to the westward they decrease both in size and in number, rising however in some cases to a height of 20 or 30 feet. Of these the highest and most conspicuous hill, or group, lies close to the sea, about one mile west of *the light-houses*, and immediately south of a large plain or meadow, where a few tall poles mark the locality of an old race-course. It is on all sides clothed with Ammophila, but is hollow and broken in the middle. A cart-road runs through the hollow, in the middle of which, and on each side of the road grows Equisetum variegatum. The spot is, on an average, not more than ten feet above the sea.

The whole district of which Barry forms a part, rests upon the Old Red Sandstone, which, according to Mr. Miller's intensely interesting work bearing the same name, derives its prevailing colour from an admixture of iron. I know not whether it is to be attributed to the same cause that much of the sand of the district is tinged with red; but in the work just alluded to I find the following. — "The oxide deposited by the chalybeate springs which pass through the lower members of the formation, would give to white sand a tinge exactly resembling the tint borne by this upper member." And it is certain that when a cut of several feet is made in almost any part of the plain of Barry, the chalybeate water immediately appears, and that its peculiar scum is seen floating along the edges of a small stream which bounds the parish on the west, and into which various chalybeate springs discharge their waters. The general appearance of the *surface* where E. variegatum grows is perhaps against the supposition that the sand has any mixture of iron; but when the sand is dug, it is found to be of a dingy brown, and the lowest stratum of the sand-hills is streaked with sand of a still deeper hue. These facts appear to confirm the remarks I lately offered on the three allied species or varieties,—E. hyemale, Mackaii and variegatum; there is, however, this difference between the two localities that I have examined, that the prevailing rocks on Deeside are granite, and, if I mistake not, granitic gneiss. The situation of E. variegatum at Barry seems to overthrow my conjecture that "the banks and bed of rivers" are its natural habitat: there is scarcely an imaginable way in which a stream could have deposited it in the spot which it now occupies.

The *roots* of the Barry plant scarcely differ from those of the Deeside variety. The *stems* are of the same variable length and number of articulations, with 4—10 striæ: they are completely prostrate, except in a few instances, when supported by Ammophila arenaria. When not sheltered by that or any other plant, they are brownish on the upper or exposed side and green on the under; it is, however, possible that the brown colour may be the effect of the lateness of the season. On the upper side also the bands of black upon the sheaths run farther down the stem than they do on the under side. The *teeth* are wedge-shaped, not ovate as at Banchory: the bristles are longer and apparently more persistent. The *catkins* are in general more exserted and matured, and, as well as the stems, have sometimes a reddish tinge. The plant seems to *branch* in the same manner as in the higher and moist situation on Deeside, 150 feet above the sea. When the sand is compacted by small plants which afford no shelter to the Equisetum, the latter is generally very small, slender and filiform; where the sand is loose or the plant has shelter, its growth is much stronger, and in the sheltered situation it is greener. In no case does the plant attain the same size as on Deeside. Some specimens slightly resemble E. Mackaii, but are perfectly distinct; the resemblance arises from the bristles being longer, and the amount of black upon the sheaths greater than in the usual state of the plant.

The links and sands of Barry form a very interesting botanical station. I have no doubt that a summer ramble among these hills and hollows would amply repay the researches of the botanical visitor; for although my visit took place at the end of October and the beginning of November, when they were in a state of decay, I could detect, among others, the following plants:—Astragalus hypoglottis, Elymus arenarius, Juncus balticus, and, I think, Erigeron acris. Juncus balticus is especially plentiful, being found in almost every part of the extensive links, and forming large plats in the meadows and hollows between the sand-hills. In this and similar places the intelligent observer cannot fail to be struck with the peculiar adaptation of the prevailing vegetable productions to the character of the soil in which they grow. To my mind it furnishes a striking instance, not only of the "Wisdom of God in Creation," but of the wisdom of God in *providence* also. In a district of almost pure sand, while the more inland and level part is covered with common vegetation and vegetable mould, the seaward portion has been gradually overgrown with Ammophila arenaria, Carex arenaria, Elymus arenarius, and several other plants, all so well fitted by their creeping roots to bind the sand and prevent it from shifting. Even Equisetum variegatum, though confined to a small space, has its creeping root, and is calculated to serve the same end. And thus, in the first instance, an arid waste of sand, either upheaved from the bottom of the sea or exposed by the gradual retiring of its waters, and in that state utterly destitute of vegetation, has, by the agency of a powerful wind, been partly accumulated into a natural bulwark against the return of the ocean; and then, while its plains have by degrees been covered with a mould which has converted them into land capable of cultivation, its still sandy heaps which compose that bulwark have become consolidated, even to the verge of the sea, by a dense covering of plants, the most prominent and important of which are found only in such localities. J. B. BRICHAN.

Manse of Banchory, December 1, 1842.

ART. CIX.—*County Lists of the British Ferns and their Allies.*

Compiled by EDWARD NEWMAN.

I DO not wish to conceal the fact that the perusal of Mr. Watson's admirable paper on the 'Geographical distribution of British Ferns,' has been the means of inducing me to attempt a still more rigid investigation of the produce of our counties, so far as regards this beautiful family of plants. In prosecuting this design, I find myself at the very threshold compelled to abandon my original intention of restricting each county list to the observations of an individual botanist: the kind and prompt attention with which my wish, expressed in 'The Phytologist,' has been met, enables me to make these lists far more interesting, by combining under each county the observations of many botanists. In employing the nomenclature formerly proposed by myself, and subsequently adopted in the valuable Catalogue published by the Botanical Society of Edinburgh, I conform to the usage of the majority of my correspondents. The authorities are arranged as nearly as possible in accordance with the dates of the letters containing the information quoted.

It appears, from carefully collating all the authorities within my reach, that the recorded species of British ferns are forty-six in number: of these one is now considered a doubtful native; twelve (printed in *italics*) are ranked by some authors as varieties; and thirty-three (printed in Roman letters) are acknowledged by every writer. By adhering to these numbers the relative proportions of each county will remain uninfluenced by the different views of botanists on this most interesting but debatable point. Species whose present existence in the county has not been verified by any of my correspondents, are marked with a dagger. †

YORKSHIRE.

Lomaria Spicant. Abundant in the neighbourhood of Sheffield; a rigid jagged variety is sometimes found, *J. Hardy:* common everywhere, *S. Gibson:* heaths, shady banks &c. abundant, *R. Spruce:* Langwith, near York, *S. Thompson.*

Pteris Aquilina. Most abundant in the neighbourhood of Sheffield, and one or two marked varieties occur, *J. Hardy:* common, *S. Gibson:* heaths, shady lanes and woods, frequent, *R. Spruce:* near York, *S. Thompson.*

Allosorus crispus. Fountain's fell, *S. Gibson:* (J. Tatham), *H. C. Watson, S. Thompson:* Cronkley-scar &c.; Teesdale; sides of Ingleborough hill; Settle, frequent; on Penhill, near the slate quarry;—*Baines's Yorkshire Flora.*

Polypodium vulgare. Abundant in the neighbourhood of Sheffield, *J. Hardy:* common in many parts of the county; var. *immersum*, mihi, this elegant variety has the sori in small dots, which are sunk in deep pits in the frond, it occurs at Whitby;—*S. Gibson:* frequent near York and Castle Howard, *R. Spruce:* near York, *S. Thompson;* var. *serratum*, Wass-woods near Helmsley, *H. Ibbotson.*

Polypodium Phegopteris. Scarce near Sheffield, *J. Hardy:* in Cave-hole wood near Settle, *J. Tatham:* common at Hebden-bridge, Halifax, and many other parts of the county, *S. Gibson:* frequent about Halifax in rocky woods (R. Leyland), *H. C. Watson:* Scawton Howle near Helmsley, very fine, Buttercrambe-moor and Langwith lane, near York, Teesdale &c. (J. Backhouse, jun.), *R. Spruce:* Ingleborough, with P. Dryopteris, *W. Wilson:* near York, *S. Thompson:* Wensley-dale, Bell-hagg near Sheffield, Penhill, gill on Bellerby-moor, Shibden-dale, Ogden-clough &c. near Halifax, rocky woods in the vale of Todmorden frequent, near Helmsley;—*Baines's Yorkshire Flora;* Bolton-woods, *H. Ibbotson.*

Polypodium Dryopteris. Scarce near Sheffield; Anston-rocks, fourteen miles from Sheffield, plentiful, *J. Hardy:* a very common plant in the neighbourhood of Hebden-bridge, *S. Gibson:* Bolton-abbey (Churchill Babington), common in woods about Halifax, *H. C. Watson:* Castle-Howard park, on the lower calcareous grit; Whitstoncliff near Thirsk; in various parts of the North and West Ridings, almost exclusively on the sandstone (J. Backhouse, jun.), *R. Spruce:* Ingleborough, *W. Wilson:* Brimham-rocks, Teesdale; near Pickering, near Whitby, near Richmond, near Helmsley;—*Baines's Yorkshire Flora;* Rievaulx woods, Luilesworth-vale, Cave-hole woods, Bolton-woods, *H. Ibbotson.*

Polypodium calcareum. Plentiful on Anston-rocks, *J. Hardy*: abundant on our hills near Settle, *J. Tatham*: neighbourhood of Settle, where the plants are smaller than those from Lancashire, *S. Gibson*: hills above Settle; this species is exceedingly distinct from Dryopteris when growing (J. Backhouse, jun.), *R. Spruce*: Ingleborough with P. Dryopteris, *W. Wilson*; Ingleborough, (W. W. Brunton), from whom I have a specimen which is eight inches from tip to tip of the lowest pinnæ, and seven and a half from the base of the lowest pinnæ to the apex of the frond, *S. Thompson*: Arncliffe and Gordale (R. B. Bowman), *H. C. Watson*: several places in Gordale, *Baines's Yorkshire Flora.*

†Woodsia Ilvensis. Richmond (J. Wood), Francis' 'Analysis of British Ferns.'

Cystopteris fragilis. Uncommon in the neighbourhood of Sheffield, *J. Hardy*; Shibden and Beeston woods near Halifax, Settle, Knaresborough, and many other places in the county. The genus Cystopteris is said to affect limestone, but I always find the varieties growing much larger, and their forms better displayed, where there is no limestone. Mr. Francis lays great stress on the length of the rachis as a character whereby to distinguish the species; if he had been a fern-collector he would have known that this character depends very much on the situation in which the plant happens to grow, if, for instance, among loose stones, the rachis will be long, if on a mortared wall, short. The same author also remarks that C. dentata is only half the size of C. fragilis, and double the size of C. alpina: my specimens of the form called fragilis vary from 2 to 18 inches in length, of that called dentata from 4 to 16 inches, and of the Low Layton plant from 1 to 8 inches; *S. Gibson*: Shibden-dale near Halifax (R. Leyland), *H. C. Watson*; on the obelisk-bridge, Castle-Howard park; on old walls &c. in various parts of the north-eastern moors; near Helmsley, and in the long walk, Knaresborough (T. B. Powell); sparingly in Teesdale, growing in caves along with C. dentata, but keeping perfectly distinct in its habit, appearance of fronds &c. (J. Backhouse, jun.), *R. Spruce*; near Rievaulx-abbey, Helmsley, *H. Ibbotson*; abundant at Eggleston-bridge on the banks of the Greta, Red-scar, Applegarth;—*Baines's Yorkshire Flora.*

Cystopteris dentata. Very common near Settle, *J. Tatham*; Settle and other places, *S. Gibson*; Egglestone-abbey bridge, and many other places in Teesdale, very fine (J. Backhouse, jun.), *R. Spruce.*

Cystopteris angustata. Scarce in three places, Gordale and Attermine scars and Catterick-force, *J. Tatham*; I have found this variety growing on the very same plant with C. dentata, at Lune-bridge, Teesdale; they are no doubt the same species, (J. Backhouse, jun.), *R. Spruce*: near Aysgarth-bridge, Wensley-dale, *Baines's Yorkshire Flora.*

Cystopteris alpina or *regia.* Near Fountain's-abbey, and on wet rocks about Knaresborough, according to Teesdale in the 'Linnean Transactions,' and in Baines's Yorkshire Flora it is said to grow near Coxwold, but I have seen specimens from none of these localities, *R. Spruce.*

Polystichum aculeatum. Not common near Sheffield, *J. Hardy*; near Triangle, four miles from Halifax, and Highgreen woods, *S. Gibson*; woods near Halifax, (R. Leyland), *H. C. Watson*; Whitstoncliff, near Thirsk; on the magnesian limestone at Thorpe-arch and other places (J. Backhouse jun.), *R. Spruce*; Thorpe-arch (J. Ellis), *S. Thompson.*

Polystichum angulare. Edlington-wood near Doncaster, not common, *J. Hardy*, in endless variety in Beeston-woods, about seven miles north-east of Halifax, Shibden and many other places near Halifax, Whitby, Richmond, &c. *S. Gibson;* Richmond, (R. B. Bowman), *H. C. Watson;* Whitstoncliff near Thirsk, on the magnesian limestone at Thorpe-arch and other places; I believe that angulare is a variety of lobatum and not of aculeatum (J. Backhouse jun.), *R. Spruce.*

Polystichum lobatum. Scarce in the Sheffield district, more common near Doncaster, *J. Hardy;* in all the woods in the neighbourhood of Hebden-bridge, *S. Gibson;* woods near Halifax (R. Leyland), a little below Catterick-force (J. Tatham), *H. C. Watson;* frequent in the stony woods about Castle-Howard, Thorpe-arch and Tadcaster, on the magnesian limestone (J. Backhouse, jun.), *R. Spruce;* near Settle (J. Tatham), *S. Thompson.*

Polystichum Lonchitis. Sparingly on the rocks above Settle, at an elevation of 1500 feet, *J. Tatham, S. Gibson;* Attermire-scar above Settle (J. Tatham), no fruit, I suspect this at least to be a young A. lobatum, *H. C. Watson;* Settle (J. Tatham), *S. Thompson,* who sends a frond, which appears to me to be the seedling, or perhaps, more properly speaking, the alpine form of aculeatum, *E. Newman;* near Malham, *W. Wilson.*

Lastræa Thelypteris. Potterie-carr, rare, *J. Hardy;* near York, in two or three localities. *S. Gibson;* abundant in Askham-bogs and Heslington-fields near York, fructifying in both places; Terrington-carr, amongst Bryum squarrosum and Hypnum nitens, *H. Ibbotson;* near Copgrove, near Doncaster, near Hovingham, near Settle, *Baines's Yorkshire Flora.*

Lastræa Oreopteris. Very common in the Sheffield district, *J. Hardy;* abundant above Swabeck, *J. Tatham;* very frequent in woods about Halifax (R. Leyland), *H. C. Watson;* frequent on the north-eastern moors, Castle-Howard park (very fine), wood near Earswick and Langwith-lane near York (J. Backhouse jun.), *R. Spruce.*

Lastræa Filix-mas. Abundant in the Sheffield district, *J. Hardy;* very common near York, *R. Spruce, S. Thompson.*

† Lastræa cristata. On Plumpton-rocks near Knaresborough, *Baines's Yorkshire Flora.* There is at present no other information about this species, *E. Newman.*

Lastræa rigida. Wharnside and Ingleborough, *W. Wilson;* on the rocks above Settle, at an elevation of 1500 feet, *J. Tatham;* Attermire-rocks and other places in the neighbourhood of Settle, *S. Gibson,* (J. Backhouse, jun.), *R. Spruce;* Clay-pit scar above Settle (J. Tatham), *H. C. Watson;* first gathered in 1815 on Ingleborough, near the foot of the mountain, towards the neighbouring village (W. T. Bree), *Newman's British Ferns.*

Lastræa dilatata. Abundant and very variable in the Sheffield district, *J. Hardy;* common in all the lanes and woods about Hebden-bridge &c. in endless variety, *S. Gibson;* very frequent near Halifax (R. Leyland), Black forest, Richmond (Rev. J. E. Leefe), both these appear to me very near spinulosa, *H. C. Watson;* the commonest fern in wet woods at Castle-Howard, Stockton forest, Leckby-carr &c. (J. Backhouse, jun.), *R. Spruce;* near York, *S. Thompson.*

Lastræa spinulosa. Spinulosa? Potterie-carr near Doncaster, *J. Hardy;* Scarborough-mere, *S. Gibson;* bog near Rufforth-grange, Langwith, Stockton-forest, Thorne-moor, Leckby-carr &c. (J. Backhouse jun.), *R. Spruce;* near York, a singular variety is found at Thorne-moor, *S. Thompson.*

Lastræa dumetorum. In stony places in Castle-Howard park, *R. Spruce.*

Athyrium Filix-femina. Abundant in the Sheffield district, *J. Hardy;* in endless variety in many places, *S. Gibson;* shady banks near York, frequent, Langwith, *S. Thompson, R. Spruce.*

Athyrium irriguum. Occurs occasionally in the Sheffield district, *J. Hardy;* Midgpool-lane near Hebden-bridge; Mr. Francis observes that this plant is very tender and without fruit; the specimens which Sir J. E. Smith sent to his correspondents are very rigid, and bear fruit very abundantly, *S. Gibson.*

† Asplenium fontanum. I found a single root of this plant on an old wall above Skipton-castle, in July 1835; I took all the fronds and the plant, of course, disappeared; and I have a specimen of the plant given to me as a Teesdale plant, but perhaps under some mistake, *S. Gibson.*

† Asplenium lanceolatum. On a wall in the village of Wharfe (Bolton), *Turner & Dillwyn*, 723.

Asplenium Adiantum-nigrum. Rather uncommon in the Sheffield district, *J. Hardy;* near Halifax and other places, *S. Gibson;* Old walls in Ray-wood, Castle Howard; on the moors near the Hole of Horcum; on the banks of the Greta, and many other places in Teesdale, Whitstoncliff &c. (J. Backhouse jun.), *R. Spruce;* rocks at Ampleforth near Helmsley, walls on the moors above Pickering, *H. Ibbotson.*

Asplenium Ruta-muraria. Common in the Sheffield district, *J. Hardy;* on the walls of Skipton-castle, near Hebden-bridge, *S. Gibson;* old walls, bridges &c. near York and Castle Howard, *R. Spruce;* York city-walls, *S. Thompson.*

† Asplenium septentrionale. Ingleborough-hill (Mr. Tofield). It does not appear to have been found by any subsequent botanist;—*Turner and Dillwyn*, 723. I have seen specimens from Ingleborough, and think it is probably there yet. *J. Backhouse, jun.*

Asplenium marinum. On the cliffs north of Scarborough, very rare, *S. Gibson.*

Asplenium Trichomanes. Common in the Sheffield district, *J. Hardy;* High-green woods and many other places, *S. Gibson;* old walls in Ray-wood, Castle Howard, Knaresborough, (T. B. Powell); on an oolitic limestone crag at Crambeck, near the Derwent; near the Hole of Horcum; on the magnesian limestone at Thorpe-arch; Whitstoncliff near Thirsk, where I find a variety with divided fronds, (J. Backhouse), *R. Spruce;* Near Pontefract, *S. Thompson;* a variety with the fronds deeply divided grows on the Whitstoncliff near Thirsk, *Baines's Yorkshire Flora.*

Asplenium viride and the ramose variety, very common near Settle, *J. Tatham;* common at Green-hill, Settle and other parts of Craven; var. *ramosum*, Ogden-kirk near Halifax; var. *acutifolium* mihi, with the pinnæ very long and pointed, this beautiful and very distinct variety was found near Settle by Dr. Chorley of Leeds, to whom I am indebted for specimens, *S. Gibson;* Aislabeck, Richmond (James Ward), Gordale (R. B. Bowman), *H. C. Watson;* specimens from near Halifax, *W. Wilson;* Cronkley-fell and many localities in Teesdale, on the limestone (J.Backhouse jun.), *R. Spruce;* Gilla-leys wood; walls on the moors near Pickering, *H. Ibbotson;* Ingleborough, Widdale-fell, Wensley-dale, Reeth-moor in Swaledale, Hill-gill near the side of the brook, *Baines's Yorkshire Flora.*

Scolopendrium vulgare. Common in the Sheffield district; var. *crispum*, plentiful near Sprotborough, two miles from Doncaster; var. *undulatum*, in Edlington-wood and on Warmsworth-cliff near Doncaster; var. *ramosum*, one plant on rocks near Sprotborough, *J. Hardy;* on the sea-coast at Scarborough, and on the hills above Settle, *S. Gibson;* Thorpe-arch (J. Backhouse, jun.); in the Long walk Castle-bank, and at Knaresborough (T. B. Powell); old walls near Castle Howard, peculiarly abundant in Mowthorpe-dell, where I have gathered many varieties; *R. Spruce;* Plumpton-park near Harrogate (J. Richardson), *S. Thompson.*

Ceterach officinarum. On the rocks above Malham-tarn near Settle, *J. Tatham, S. Gibson;* on the old walls of Kirklees-park, near Halifax, *S. Gibson.*

† Trichomanes speciosum. Found by Dr. Richardson at Belbank, scarce half a mile from Bingley, at the head of a remarkable spring, and nowhere else (Ray, Syn. 128, pl. iii. fig. 3); in September, 1782, I found this rare plant in Belbank-wood near Bingley, the place mentioned in Ray's Synopsis (Mr. Teesdale, in his Supplement to 'Plantæ Eboracenses,' published in the 'Transactions of the Linnean Society of London); Trichomanes brevisetum was certainly found near Bingley by Bolton, I have seen a specimen from that place, *S. Gibson;* it was figured in 'English Botany,' pl. 1417 [1445, new edit.] from specimens collected in this locality, but I understand it does not now exist there, *R. Spruce;* it was figured by Bolton from a specimen from Belbank-wood near Bingley; the spring-head near which it was found is now walled in to supply the town of Bingley with water, but the wood is very large, and it is very likely to be somewhere else in the neighbourhood, *J. Backhouse, jun.*

Hymenophyllum Wilsoni. Turner-clough, seven miles from Halifax on the Oldham road, *S. Gibson;* rocks near Lower Harrogate (J. Backhouse jun.), *R. Spruce;* Greenfield, *W. Wilson.*

Hymenophyllum Tunbridgense. Near Todmorden, *S. Gibson;* on rocks by a stream running down to the sea at a place called Hayburn-wyke, near Whitby (Mr. Peterkin), *R. Spruce;* near Halifax and at Greenfield, *W. Wilson.*

Osmunda regalis. Rare about Sheffield, more plentiful in the Doncaster district, *J. Hardy;* Ayton-forge near Scarborough, *S. Gibson;* Askham-bogs; Langwith-moor; Wheldrake-lane (J. Backhouse jun.); bog near Haigh-park windmill, Knaresborough (R. B. Powell), *R. Spruce;* Beck-hole near Whitby, *Baines's Yorkshire Flora.*

Botrychium Lunaria. Widely distributed in the Sheffield district, but never occurring in any quantity, *J. Hardy;* abundant in Tarn-field pasture near Settle, *J. Tatham;* Midgley-moor, *S. Gibson;* near Halifax, in dry fields, not very plentiful (R. Leyland), *H. C. Watson;* very fine in pastures at Ganthorpe near Castle Howard; near Coneysthorpe; Terrington-carr; Knavesmire, York; wood near Earswick; Low Harrogate (J. Backhouse jun.), *R. Spruce;* Airyholme near Hovingham, above the wood bridge that crosses the Tees to Lower Cronkley, and at Moor-riggs in Teesdale; Cotherstone-fell; on the Hambleton hills, frequent; near Whitby; Halves-farm pastures near Knaresborough; near Richmond; *Baines's Yorkshire Flora.*

Ophioglossum vulgatum. Common in the Sheffield district, *J. Hardy;* common in many places, *S. Gibson;* Round Howe near Richmond (James Ward), *H. C. Watson;* abundant in old pastures and woods around Castle Howard, where I have seen plants six inches high, growing amongst Equisetum fluviatile; not unfrequent near York, *R. Spruce;* damp meadows near York, abundant, *S. Thompson;* Ganthorpe-moor, Langwith, near York, *H. Ibbotson.*

Lycopodium clavatum. High moors five miles from Sheffield, abundant, *J. Hardy;* very sparingly on moors in the vale of York, as on Stensall, Stockton-forest, &c. but abundant on all the moors in the north riding, *R. Spruce;* Stockton-common near York (J. Backhouse, jun.), *S. Thompson;* Terrington-carr (H. Ibbotson to J. Storey), *H. C. Watson;* Midgley-moor, *S. Gibson;* common on elevated moors, *H. Ibbotson.*

Lycopodium alpinum. High moors five miles from Sheffield, not common, *J. Hardy;* very common on Cronkley-fell and many other places in Teesdale (J. Backhouse jun.), Hutton Bushel moor, near Scarborough (Mr. Peterkin), *R. Spruce;* very abundant on the side of Ingleborough, near the summit; Aislaby low moor near Whitby; on Sowerby, Wadsworth and Midgley moors, frequent; *Baines's Yorkshire Flora*; Cronkley-fell, Teesdale, Pen-y-ghent (R. B. Bowman), *H. C. Watson.*

Lycopodium inundatum. Plentiful in various parts of Strinsall and Towthorpe moors, as well as in Stockton-forest; Terrington-carr, scarce, *R. Spruce*; Stockton-common, *S. Thompson, S. Gibson*; in a sand-pit on the Malton-road, four and a half miles from York; Norland-moor near Halifax, *Baines's Yorkshire Flora*; Shackle-moor near Castle-Howard, *H. Ibbotson.*

Lycopodium selaginoides. Stockton-forest; Welburn-moor near Castle Howard; Teesdale, (J. Backhouse, jun.); Goldsbro'-moor near Knaresborough (J. B. Powell); Hackness near Scarborough (Mr. Peterkin), *R. Spruce*; Stockton-common, *S. Thompson*; on a part of the moor opposite the poor-houses in Wheldrake-lane, four miles east of York; on an island just above the bridge that crosses the Tees to Lower Cronkley; various places near Settle; in a marshy place on the moor north-west of the Beacon, near Richmond; on the top of Whitstoncliff near Thirsk; *Baines's Yorkshire Flora*; near the beacon, Richmond (James Ward), Towthorpe-moor (J. Storey), *H. C. Watson.*

Lycopodium Selago. High moors five miles from Sheffield, not common, *J. Hardy*; sparingly on Stockton-forest and Slingsby-moor, but not unfrequent on the north-eastern moors, *R. Spruce*; Pen-y-ghent and Ingleborough (J. Tatham), *S. Thompson*; near Settle, abundant; Penhill; moors near Halifax, Todmorden &c., *Baines's Yorkshire Flora*; Pen-y-ghent (R. B. Bowman), *H. C. Watson*; High-green woods, and many other places in the county, *S. Gibson.*

Isoetes lacustris. Castle-Howard lake; in the Foss reservoir near Coxwould, *H. Ibbotson.*

Pilularia globulifera. Stockton-common near York, Scarborough-mere &c. *S. Gibson*; margin of Gormire-pool near Thirsk, *H. Ibbotson*; Gormire, at the base of Whitstoncliff; Stockton-forest near York, (O. A. Moore); and near Richmond, *Baines's Yorkshire Flora.*

Equisetum hyemale. By the Derwent at Crambeck; near Raskelf (J. Backhouse jun.), *R. Spruce*; from Wakefield to Pontefract; Goodland-dale near Whitby; Hackness near Scarborough; near Halifax, *Baines's Yorkshire Flora*; dry woods at Castle Howard and Kirkham, not common (Teesdale), about Leeds but rare (Rev. W. Wood), Hackfall (Rev. J. Dalton) &c. *Turner & Dillwyn*; Bolton-woods in Wharfedale, *S. Gibson*; by the banks of a rivulet at Conesthorpe, *H. Ibbotson.*

Equisetum variegatum. Near Winch-bridge, and other places in Teesdale, *S. Gibson, C. C. Babington,* (J. Backhouse) *R. Spruce*; *H. Ibbotson.*

Equisetum palustre. Common in the Sheffield district, *J. Hardy*; abundant near York, particularly in ditches by the river Foss and in Hob-moor brick-ponds; not unfrequent throughout the district, *R. Spruce*; common, we have three or four varieties of this species, some of them not uncommon, *S. Gibson.*

Equisetum limosum. Plentiful in the Sheffield district, *J. Hardy*; abundant near York, particularly in ditches by the river Foss, and in Hob-moor brick-ponds; not unfrequent throughout the district, *R. Spruce*; at the bottom of Wensley-dale, *Baines's Yorkshire Flora*; common, we have two forms of this plant, perhaps as distinct as E. Mackaii from E. variegatum, one, much smaller and having fewer teeth on the sheaths, grows in the canal near Hebden-bridge, the other and larger plant grows near Selby, *S. Gibson.*

Equisetum sylvaticum. Not common in the Sheffield district; I have never gathered it in fruit; a slender variety with the branches much attenuated is sometimes met with, *J. Hardy;* moist meadows at Ganthorpe near Castle Howard, *R. Spruce;* Goadland-dale near Whitby; near Green Hammerton, Settle, Richmond, Leeds &c.; by the brook at Hesketh-grange, near Boltby, Arncliff woods, *Baines's Yorkshire Flora;* common, *S. Gibson.*

Equisetum arvense. Too common in the Sheffield district, *J. Hardy;* moist meadows, cornfields &c. frequent, *R. Spruce;* common, *S. Gibson, H. Ibbotson.*

Equisetum fluviatile. Frequent near Castle Howard, especially in boggy woods, where I have seen branched fronds a foot high, surmounted by catkins; Langwith, Stockton and other places near York, also near Malton (J. Backhouse jun.), *R. Spruce;* in the Roche at Roche-abbey; roadside between Thornburgh and Upsall; wood on Wass-bank on the road to Helmsley; Arncliff wood, *Baines's Yorkshire Flora;* Lombard's-clough near Todmorden, *S. Gibson.*

EDWARD NEWMAN.

(To be continued).

ART. CX.—*Additions to the Phænogamic Flora of ten miles round Edinburgh.* By THOMAS EDMONSTON, jun. Esq.

(Continued from p. 407).

PLANTS NOT PREVIOUSLY OBSERVED IN THE DISTRICT.

Plantago Coronopus, var. β. *nana.* Abundant near Granton, and elsewhere.

Symphytum officinale, var. β. *patens.* Near Muttonhole, &c.

SPECIES PREVIOUSLY OBSERVED.

Geranium rotundifolium. Very fine at Preston-pans.

Geum intermedium. Abundant in many places, as at Roslin, Hawthornden, &c. Is this a species or not?

Habenaria chlorantha, Bab. After observing this plant very attentively for some time, and comparing it with the allowed H. bifolia, and with specimens from the Edinburgh Botanical Society, from Mr. Babington, and other eminent botanists, of their H. chlorantha, I must say that I cannot see permanent grounds of specific distinction. The extreme forms appear very unlike, but the intermediate ones are so very common, that it appears to me there are scarcely sufficient reasons for separating the plants. I should much like to see in 'The Phytologist' a record of the observations of some botanist familiar with the plants in a living state.

Hieracium sabaudum. One of the most common Edinburgh hawkweeds.

Hordeum pratense. Not now to be found in the district; some fine specimens occurred to Dr. Neill in the King's Park many years since.

Juncus obtusiflorus. Pentland Hills. A curious viviparous variety of J. supinus (J. uliginosus), with half-prostrate stems from a foot to two and a half feet long, occurs with the preceding in the marshes near Collinton.

Lamium Galeobdolon and *rugosum.* Dalkeith Park. L. album, *Linn.*, L. maculatum, *Linn.*, and L. rugosum, *Ait.*, appear to be correctly referred by some authors to states of the same species.

Leontodon palustre. Very abundant on the Pentland Hills and elsewhere near Edinburgh. From several years' observation of this plant in Shetland and elsewhere, I am inclined to think it is a good species, although now generally sunk into a variety of L. Taraxacum. The characters drawn from the involucre appear to be constant in all the specimens I have seen; and it is by no means improbable that small specimens of L. Taraxacum have been confounded with palustre, for I have seen them growing together, and each preserving its distinctive characters.

Leontodon autumnale. Specimens of a curious variety of this plant having a very stout scape, and covered with a very dense, long, and silky pubescence, occur near Collinton. It is exactly similar to some specimens brought from the Outer Hebrides by Dr. Balfour and Mr. Babington last year, and exhibited at the Botanical Society.

Polygala vulgaris. I have observed some curious variations in the size of the leaves and sepals, and in the habit, of some Polygalas on Arthur's Seat, Braid, Blackford and Corstorphine hills, &c., and Mr. E. Forbes has registered the same. Whether these differences may prove sufficiently constant to constitute species, I must leave to future observers.

Potamogeton. Great numbers of this intricate genus are to be met with around Edinburgh, and, I have little doubt, forms (or species) different from those described, but I confess myself perfectly unable to distinguish many of the puzzling forms; and I do think that minute differences in the shape of the fruit are not always to be depended on.

Primula veris, α. Lin. (P. veris of authors), *β.* Lin. (P. vulgaris) and *γ.* Lin. (P. elatior of British botanists, P. acaulis, *β. caulescens*, Balfour and Babington). All these forms (for it seems now fully proved that they are no more) are common about Edinburgh.

Sedum reflexum. St. David's, Fife.

***Senecio aquaticus*, *β. erraticus*, and other curious states, occur at Duddingston-loch.**

***Stratiotes aloides*. Abundant in a brook which runs into Duddingston-loch. This plant, and Butomus umbellatus, are said to have been planted in the above station, but I know not on what grounds.**

***Thalictrum flavum*. St. David's, Fife.**

***Trifolium incarnatum*. Aberlady, Haddingtonshire, apparently indigenous.**

THOS. EDMONSTON, JUN.

Baltasound, Shetland,
November 27, 1842.

ART. CXI. — *Some Account of the Botanical Collections recently made by Dr. Theodore Kotschy (for the Wurtemburg Botanical Union) in Nubia and Cordofan.* Communicated by MR. WM. PAMPLIN, jun.

(Continued from p. 420)

WE will now proceed to give a complete enumeration of the species contained in the entire collection.

Marsileaceæ.
Marsilea nubica, *Al. Braun*
Alismaceæ
Alisma Kotschyi, *Hochst.*
enneandrum, *Hochst.*
Sagittaria nymphææfolia
Hydrocharideæ.
Udora cordofana, *Hochst.*
Nymphæa cærulea, *Savi*
ampla, *Cand.*
Lotus, *L.*
Gramineæ.
Cenchrus echinatus, *L.*
longifolius, *Hochst.*
macrostachys, *Hochst.*
Elytrophorus articulatus, *B.*
Cynodon Dactylon, *Pers.*
Digitaria ciliaris, *Koel.*
Chloris punctulata, *Hochst.*
spathacea, *Hoc.* [*W.*
Dactyloctenium ægyptiacum
Helopus annulatus, *Nees*
Schœnefeldia gracilis, *Kth.*
Lappago occidentalis, *Nees*
racemosa, *Schreb.*
Leptochloa arabica, *Kunth*
Aristida hordeacea, *Kunth*
Kotschyi, *Hochst.*
meccana, *Hochst.*
Sieberiana, *Trin.*
stipiformis, *Lam.*
plumosa, *L.*
uniglumis, *Lichst.*
Setaria imberbis, *R. S.*
verticillata, *Beauv.*
Pennisetum lanuginosum *H.*
Gymnothrix nubica, *Hochst.*
Panicum arvense, *Kunth*
turgidum, *Forsk.*
subalbidum, *Kunth*
Petiverii, *Kin.*
Kotschyanum, *Hoch.*
Sporobolus glaucifolius, *H.*
Crypsis schœnoides, *Lam.*
Oryza sativa, *L.* [*Forsk.*
Andropogon annulatus,
Gayanus, *Kunth*
nervatus, *Hochst.*
Sorghum saccharatum, *Per.*
halapense, *Pers.*
Diplachne elongata, *Hoch.*
alba, *H.*
poæformis, *H.*
Poa ciliaris, *L.*
Eragrostis tremula, *H.*
pilosa, *Beauv.*
megastachya, *Link*
Triachyrum cordofanum, *H.*
Ctenium elegans, *Kunth*
Cyperoideæ.* [*Rttb.
Cyperus conglomeratus,
elongatus, *Sieb.*
aristatus, *Sieb.*

Cyperus retusus, *Nees*
squarrosus, *L.*
lepidus, *Hochst.*
Lamarckianus, *Schult.*
resinosus, *Hochst.*
pygmæus, *Rottb.*
rotundus, *L.*
vulgaris, *Kunth*
Fimbristylis hispidula, *Kth.*
dichotoma, *Vahl.*
Isolepis prælongata, *Nees*
Heleocharis monandra, *H.*

Commelinaceæ.

Commelina subaurantiaca, *H*
Forskaolii, *Vahl*

Juncaceæ.

Tenagocharis alismoides, *H.*

Palmeæ.

Cucifera thebaica, *Del.*

Coronarieæ.

Asphodelus fistulosus, *L.*

Characeæ.

Chara brachypus, var. nubica, *Al. Braun*

Amentaceæ.

Salix — sine flor.

Urticaceæ.

Ficus glumosa, *Caill.*

Nyctagineæ.

Boerhaavia hirsuta, *W.*
repanda, *W.*
vulvariæfolia, *Poir.*

Aristolochieæ.

Aristolochia Kotschyi, *Hch.*

Laurineæ.

Cocculus Bakis, *A. Rich.*

Plumbagineæ.

Plumbago auriculata, *Lam.*

Rubiaceæ.

Spermacoce compacta, *Hch.*
leucodea, *H.*
Borreria radiata, *Cand.*
Mitrocarpus senegalensis, *C.*
ampliatus, *Hochst.*
Kohautia strumosa, *Hochst.*
senegalensis, *Cham.*
No. 138.
cæspitosa, *Schnizl.*

Compositæ.

Dicoma tomentosa, *Cass.* =
Schaffnera carduoides, *Sch.*
Diplostemma acaule, *C. H.*
alatum, *Hchs* [*Schlt*
Sphæranthus angustifolius,
nubicus, *Sch.*= [*Cnd.*
Sprunera alata, *Schultz*
Vernonia paucifolia, *Less.* β.
angustifolia
Ageratum conyzoides, *L.*
Bidens bipinnata, *L.*
Ethalia gracilis, *Cand.*
Pluchea Kotschyi, *Schltz.*
Gnaphalium niliacum, *Rad.*
Cotula cinerea, *Del.*
anthemoides, *L.*
Inulaster Kotschyi, *Schultz*
Pulicaria undulata, *Cand.*
Francœuria crispa, *Cass.*
Doellia Kotschyi, *Schultz*
Pegolettia senegalensis, *Cas.*
Stengelia Kotschyana, *Hch.*
Blainvillea Gayana, *Cass.*=
Eisenmannia clandestina, *S.*
Hinterhubera Kotschyi, *Sch*
Eclipta erecta, *L.*
Sclerocarpus africanus, *Jacq*
Dipterotheca Kotschyi, *Sch.*
Microrhynchus pentaphyllus,
Sonchus cornutus, *Hoc.* [*Ho.*
Xanthium strumarium, *L.*

Cucurbitaceæ.

Bryonia fimbristipula, *Fenz*
Momordica crinocarpa, *Fnz*
Cymbalaria, *F.*
Balsamina, *L.*
Cyrtonema convolvulacea, *F*
Coniandra corallina, *F.*
Cucurbita exanthematica, *F*
Cucumis Bardana, *F.*
cognata, *F.*
ambigua, *F.*

Labiatæ et Verbenaceæ.

Moschosma polystachyum, *B*
Ocymum dichotomum, *Hch.*
lanceolatum, *Schum.*
menthæfolium, *Hchst.*
Leucas ciliata, *Bnth.* β. hirsuta
Leonotis pallida, *Benth.*
Verbena supina, *L.*
Holochiloma resinosum, *H.*
Volkameria Acerbyana, *Vis*

Asperifoliaceæ.

Echium setosum, *Del.*
Coldenia procumbens, *L.*
Heliotropium undulat. *Vhl.*
cordofanum, *Hochst.*
subulatum, *H.*
bicolor, *H.*
supinum, *L.*
pallens, *Caill.*
ovalifolium, *Forsk.*
indicum, *L.*
Cordia abyssinica, *Hochst.*
Anchusa asperrima, *Del.*

Convolvulaceæ.

Convolvulus pycnanthus, *H*
rhiniospermus, *H.*
filicaulis, *Vahl.*
lachnospermus, *H.*
microphyllus, *Sieb.*
Batatas pentaphylla, *Chois.*
auriculata, *Hochst.*
Ipomœa Kotschyiana, *Hch.*
coscinosperma, *H.*
gnaphalosperma, *H.*
coptica, *Roth*
repens, *Roth.*
palmata, *Frsk.*
cardiosepala, *H.*
pinnata, *H.*
acanthocarpa
sulphurea, *H.*
trematosperma, *H.*

Polygalaceæ.

Polygala erioptera, *Cand.*
eriopt. var. pubescens
obtusata, *Del.*

Personatæ.

A.—*Rhinantheæ.*

Striga orchidea, *Hochst.*
hermontica, *Del.*
Chascanum marrubiifol. *F.*
lacteum, *F.*

B.—*Acanthaceæ.*
Acanthodium hirtum, *Hoch.*
Monechma hispidum, *H.*
  bracteosum, *H.*
Polyechma cæruleum, *Hch.*
Dipteracanthus patulus, *Nees*
Asteracantha macrurantha, *H*
Barleria Hochstetteri, *Nees*
Thunbergia annua, *Hochst.*
Thyloglossa sexangularis, *H*
  = Rostellaria sexang. *H.*
  palustris, *Hochst.* =
  Gendurussa palustris, *H.*
Peristrophe bicalyculata, *N.*
Dicliptera spinulosa, *Hochst.*
Hypoëstes latifolia, *Hochst.*
Eranthemum decurrens, *H.*
C.—*Scrophularieæ.*
Macrosiphon elongatus, *H.*
  fistulosus, *Hochst.*
Chilostigma pumilum, *Hchs*
Sutera serrata, *Hochst.*
  dissecta, *Endl.*
Anticharis arabica, *Endl.*
D.—*Bignoniaceæ.* [*H.*
Ceratotheca melanosperma,
Sesamum rostratum, *Hochst.*
  orientale, *L.*
Pedalium Caillaudii, *Del.*
Solanaceæ.
Solanum dubium, *Fres.* var.
  aculeatiss.
Solanum nigrum, *L.*
  albicaule, *Kotschy*
  hastifolium, *Hochst.*
Capsicum conicum, *Meye*
Physalis somnifera, *L.*
Lysimachiaceæ.
Utricularia inflexa, *Forsk.*
  stellaris, *L.*
Asclepiadeæ.
Conomitra linearis, *Fenzl.*
Canahia Delilei, *Cand.*
Glossonema Boweanum, *C.*
Contortæ.
Hippion hyssopifolium, *S.*
Sapotaceæ.
Styrax officinalis, *L.*

W. PAMPLIN, JUN.

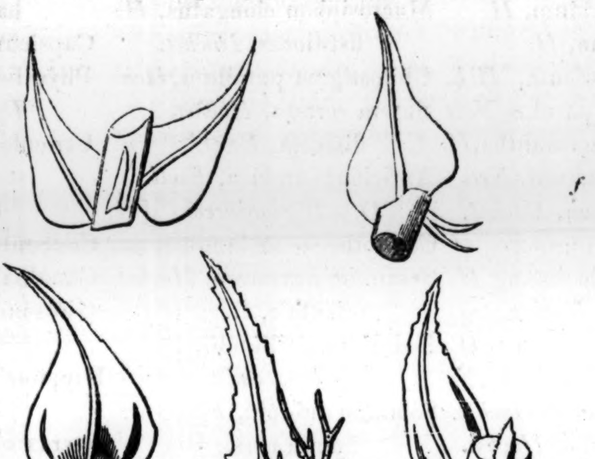
(To be continued).

ART. CXII.—*Varieties.*

242. *On the poisonous effects of the Seeds of Hemlock.* In Lindley's 'Introduction to the Natural System,' 2nd ed. p. 22, it is stated that "the fruit of the Umbelliferæ is in no case dangerous." In the 'Pharmaceutical Journal' of this month, p. 337, Dr. Pereira mentions the case of a gentleman who suffered severely from having drank an infusion of anise, in which *some* seeds of Conium maculatum were detected. From the expressions used by the Dr. I presume that they were not numerous. It appears to me very desirable that the point should be set at rest. Dr. Maton is quoted by Paris in his Pharmacologia, as stating that the value of Extractum Conii is much increased by including the seeds in the preparation. If any confidence is to be placed in the case detailed by Dr. Pereira, which is taken by him from the 'Journal de Chimie Medicale' for August, 1842, it would appear that an infusion of the seeds is infinitely more powerful than the extract usually procured in commerce, since Dr. John Davy has admistered the latter in drachm doses daily, with scarcely any untoward symptoms.—*Geo. Sparkes; Bromley, Kent, November 5, 1842.*

243. *On the folia accessoria of Hypnum filicinum*, Lin. A short time ago, whilst walking along the banks of one of our rivers, I happened to take up a tuft of that state of Hypnum filicinum which has been called H. fallax by Bridel, and on scrutinizing it with my pocket-lens, was surprised to observe, scattered here and there on the stem, several minute leaflets, scarcely one tenth so large as the true leaves, but yet resembling them in appearance. I brought the tuft home with me, and took an early opportunity of examining it with the microscope. I found these "folia accessoria" to occur chiefly towards the summit of the main stem, and more sparingly on the principal branches. In shape they are lanceolate, denticulate at the margins (*a*), nerveless (so far as I have observed), more delicate and with a wider reticulation than the true leaves. Sometimes they stand singly, as in figures *b, c, d;* not unfrequently several are found near each other, when they are smaller than usual; but most generally they stand in pairs, one leaflet partially overlying the other (*e f*). I observe them to be si-

tuated indifferently near the base or in the axil of a leaf, so that they cannot be considered stipules; but their most usual position is midway between two consecutive leaves.



Accessory leaves of Hypnum filicinum.

a—c. Accessory leaves standing singly. *d.* Accessory leaf and radicles. *e, f.* Accessory leaves occurring in pairs. *g* Leaf of a branch bud. All the figures are magnified.

My first impression was that they were *branch-buds ;* but the *true* branch-buds, which exist copiously on elongations of the stems, are first displayed as little bulbs bursting forth from the stem, and are composed of closely packed and very minute leaves, of the shape represented at fig. *g*. Afterwards, remarking that the folia accessoria were confined to the upper part of the stem, while the lower part was profusely clothed with radicles. I thought it barely possible that the former might pass into the latter; but after a very careful scrutiny I detected several instances of the two organs occurring intermixed, and each preserving its characters unaltered; thus, the radicles, in their most rudimentary state, were jointed cylinders of a deep brownish-purple hue; while the accompanying folia accessoria were pale green, cellular, foliaceous expansions: an instance of their conjunction is figured at *d*. I may add that the folia accessoria are more abundant on the upper, the radicles on the under part of the stem. These peculiar appendages I believe have been hitherto unnoticed, although they certainly exist in every state of Hypnum filicinum with which I am acquainted; it is, however, singular that they should be absent from the very nearly allied species H. commutatum, at least my specimens do not show them. It is by no means improbable that other species of Hypnum may possess folia accessoria, which, from their minuteness, have been overlooked by previous observers; and perhaps this brief account of what I have myself notited, may induce some of your correspondents, who have a love for muscology, to make more extensive observations with a view of ascertaining the fact.—*Richard Spruce, F.B.S.E.; York, November* 16, 1842.*

244. *Information on Byssus barbata*, Eng. Bot. Your correspondent Mr. Lees requests information respecting Ozonium auricomum (Phytol. 428), the Byssus barbata of Withering and early English authors. This production was first denominated Ozonium auricomum by Link in 'Berlin Magazin,' and this generic title was confirmed by Persoon in the 'Mycologia Europæa.' It is not introduced in the second part of vol. v. of 'English Flora,' because Fries, Berkeley, and all the best mycologists of the present day, consider it best to exclude this and other doubtful productions from the catalogue of Fungi. The fructification of Ozonium is quite unknown, and this singular plant is believed to be an abnormal and barren state of some other Fungus, probably a Thelephora. I have sometimes fancied it bore some resemblance to Thelephora hirsuta, but this plant only grows on rotten wood and stumps of trees, whilst Ozonium auricomum is occasionally found on damp walls. The figure in Withering of its supposed fructification represents nothing possible. Although I fully concur in the propriety of excluding this plant, with the Rhizomorphæ and similar puzzling articles, from the body of mycological works, they are too interesting to be passed over without notice, and might, I think, be described in an Appendix, especially as most young fungists are disappointed by finding no mention made of them. Mr. Lees will find an admirable figure of Ozonium auricomum in Greville's 'Scottish Cryptogamic Flora,' iv. tab. 260; the description by Dr. G. contains all that is known concerning its structure, with the synonymy from the time of Dillenius upwards.—*H. O. Stephens; 78, Old Market-street, Bristol, December* 2, 1842.

245. *On the narrow-leaved Hypericum perforatum.* The narrow-leaved variety of Hypericum perforatum noticed in 'The Phytologist' for this month, (Phytol. 427), has been long known to me as a native of this island, where it is far from uncommon in similar situations with the ordinary form of the species, into which it passes by insensible gradations. Indeed the broad-leaved and normal state of H. perforatum is decidedly uncommon with us, though such a plant does occasionally occur, and makes a certain approach to H. dubium of Smith, in having but few pellucid dots upon the leaves, and one or more of the sepals is elliptical, oblong and obtuse, while the remainder preserve their usual acuteness of termination. I have never gathered the real dubium in flower, but I possess dried specimens in that state from others, and I found at Mucruss in October last what I take to be the genuine plant of 'English Botany' &c., but quite out of bloom, having *all* the sepals elliptical-oblong, rounded at the tip, and somewhat recurved; in habit the Irish plant was more like H. quadrangulum than H. perforatum, so similar indeed that I did not readily distinguish the two as they grew together, until more closely examined. My kind and liberal friend, Dr. Wood of Manchester, has pointed out to me since then the strongly marked pellucid reticulations of the leaves in H. dubium, when viewed by transmitted light, as affording an excellent character, in addition to those previously laid down for distin-

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* Since writing the above, I have received a communication from Dr. Taylor (in answer to a letter enclosing Hypnum filicinum with folia accessoria), wherein he observes—" the name *filicinum* seems to have been applied almost prophetically to this species, which alone possesses these cauline scales that remind one of the ferns; they probably perform the same functions as the leaves, and yet they appear to be universally without nerves."—*R. S.*

guishing this rather obscure or ill understood species from the common H. perforatum. I collected seeds of the Killarney dubium for the purpose of testing its immutability under cultivation. The breadth of the leaves in our narrow forms of H. perforatum, varies extremely, as I before observed, being sometimes quite linear, more frequently however linear-oblong or linear-elliptical, with deflexed margins; in height, erect habit, and corymbose inflorescence, this variety agrees exactly with that described by Mr. Westcott. Besides being the H. veronense of Schrank, our variety seems to be the H. stenophyllum of Opitz, Winn. et Grab. Fl. Siles. ii. 82; H. perforatum, δ. angustifolium, Gaud. Fl. Helv. iv. 628; whilst our less common broad-leaved state I suppose identical with Gaudin's H. perforatum, β. latifolium, l. c. s., and of Koch in the enlarged edition of Röhling's 'Deutschland's Flora,' Vter band. s. 349, a work unequalled for laborious research and accuracy of detail. Gaudin's description of our narrow leaved perforatum, leaves no doubt that his Swiss plant is absolutely the same as the British one. — *Wm. Arnold Bromfield;* * *Eastmount, Ryde, Isle of Wight, December* 3, 1842.

246. *Curious state of Carex panicea.* I have lately received a curious variety of Carex panicea, which I do not find noticed in any work on British plants. It differs from the common state of the plant in having *double perigynia*, the second or upper ones with their peduncle passing through the orifice of the first or lower ones; the lower perigynia also have the usual number of stigmas. As such forms are not common amongst the Carices, perhaps it may be interesting to some of the readers of 'The Phytologist' to know that they do occasionally occur. The plant was found at Bristol, in June, 1842, by Miss Wood, Liverpool-road, Islington, to whom I am indebted for the specimen.—*Samuel Gibson; Hebden Bridge, December* 5, 1842.

247. *Hierochloe borealis*, (Phytol. 426). In August, 1836, I went with a party of botanists to seek for this plant in *Glen Cally*, which is within three or four hours' walk from the Spittle of Glen Shee. Unfortunately we set out in the afternoon, and did not reach the place until the day was far spent; so that before we had penetrated the recesses of the Glen, the evening shadows warned us to depart. The fatigues and the dangers of our return by a shorter but untried route across the mountains, and our descent long after sunset, will not soon be forgotten. Had time permitted, I have no reason to think that we should have been unsuccessful in our search for this plant.—*W. Wilson; Orford Mount, near Warrington, December* 10, 1842.

248. *Supposed new British Fern.* On recently comparing the specimens of Adiantum Capillus-Veneris, gathered by Mr. Ward at Ilfracombe in Devonshire, in 1840, with one from the Isles of Arran, given to me when Ireland, by Mr. Reilly of Galway, I found a marked difference in the general character and habit of the two plants; and on closer inspection I discovered in the footstalks of the leaves a difference which appeared perfectly constant, so far as the specimens before me are concerned. In the Arran specimen each pinnule is articulated to a somewhat capitate footstalk, from which it may be separated by a very slight touch: in this character as well as in the form of the pinnules, it appears identical with a common West Indian species which I suppose to be the Adiantum fragile of Willdenow's 'Species Plantarum.' My object in publishing this supposed discovery in its present crude form, is to invite those botanists who happen to possess specimens from both localities, to compare them, with a view of establishing or disproving my conjecture. —*Edward Newman; December* 10, 1842.

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* In a letter to E. Newman.

ART. CXIII. — *Proceedings of Societies.*

BOTANICAL SOCIETY OF EDINBURGH.

Wednesday, *December* 7.— Prof. Christison in the chair. The election of office-bearers for the season took place: — Dr. Neill, President; Professors Christison, Graham, Balfour and D. Stewart Esq., Vice-presidents. Various parcels of plants were announced, also donations to the library from Dr. Müller of Emmerich, Dr. Maly, &c.

Professor Christison then submitted to the Society a highly interesting communication on the Assam tea-plant, illustrated by specimens. The author stated that the different kinds of tea were produced by different modes of preparation, and showed by a series of examples of the preserved tea-leaf, that the various forms were merely varieties of the same plant. A specimen of tea, of a yellow colour, and of a remarkably strong flavour, was exhibited; also tea, in the form of small rolls, sent to this country about twenty years ago, as a present from the Emperor of China to George IV.

Mr. Goodsir then read a paper by Charles C. Babington, Esq., F.L.S., F.GS., entitled "Observations upon a few plants, respecting the claim of which to be considered as natives of Great Britain, Sir W. J. Hooker expresses doubt in the 5th edition of his 'British Flora,' with a few notes upon other species contained in that work, with reference to the Edinburgh 'Catalogue of British Plants.' The object of this paper was to show upon what evidence the authors (Professor Balfour, Mr. Babington himself, and Dr. Campbell) of the Botanical Society's 'Catalogue of British Plants' had included in it the species concerning which Sir W. J. Hooker expresses doubt. "I cannot allow this opportunity to pass," says the author of this paper, "without expressing the great satisfaction which it gives me to see that so distinguished a botanist as Hooker has considered the catalogue deserving of quotation *throughout his work*, as I must consider it a proof that the compilers of the 'Catalogue of British Plants' have not produced a work discreditable either to themselves or to the Society that intrusted its preparation to them."

Mr. Brand afterwards read to the Society a " Notice of the presence of Iodine in some plants growing near the sea," by G. Dickie, M.D., Lecturer on Botany in the University and King's College, Aberdeen. The author found, by chemical examination of specimens of *Statice Armeria*, from the sea-shore, and of others from the inland and higher districts of Aberdeenshire—that the former contained iodine, and that soda was more abundant in them, while potass prevailed in the latter. Iodine was also found in *Grimmia maritima*, and Mr. P. Grant of Aberdeen, has found it in *Pyrethrum maritimum*. An analysis was made of examples of *Statice Armeria*, *Grimmia maritima*, *Lichina confinis* and *Ramalina scopulorum*, all growing near the same spot, and occasionally during storms exposed to the sea spray; and all these plants, with the exception of the lichen, contained iodine. The specimens having been washed previous to analysis, the iodine could not have been derived from saline incrustation. All these vegetables were healthy, and the author of the paper has been led to conclude that marine Algæ are not the only plants which possess the power of separating from sea-water the compounds of iodine, and of condensing them in their tissues, and this without any detriment to their healthy functions.

BOTANICAL SOCIETY OF LONDON.

November 18.—Adam Gerard Esq. in the chair. Donations of British plants were announced from Miss S. B. Hawes and Miss S. K. Barnard. The continuation of the paper commenced at the last meeting, on the *Lodoicea Sechellarum*, by George Clark, Esq., was read.

The Lodoicea Sechellarum is an intertropical plant peculiar to the Sechelles Archipelago, where it grows naturally in two islands only, Praslin and Curiense. Praslin lies to the north-east of Mahè, distant twenty-one miles; Curiense to the north of Praslin, and is much smaller: a deep arm of the sea, from one to two miles in breadth, separates these two islands. They lie between 4° 15' and 4° 21' S. latitude, and 55° 39' and 55° 47' E. longitude. In the other islands of the Archipelago there are but few Lodoiceas, which have all been planted, and only two or three appear to thrive.

The trunk or stem is straight, and rises to the height of 80 or 90 feet, and is terminated by a splendid crown of winged palmated leaves; it is only from 12 to 15 inches in diameter, and so flexible that it waves to the slightest breeze. When the wind is moderately strong, the huge leaves of this giant palm are clashed together with an astonishing noise. The outside of the stem is very hard and compact, while the interior is soft and fibrous. The leaves, winged and palmated, open like a fan, and in their early growth are more than 15 feet long, without reckoning the foot-stalk, which is at least as much more. In the mature trees the leaf-stalk is not more than 8 or 10 feet long, and the whole leaf does not exceed 20 feet in length by 10 or 12 in breadth, and is entirely destitute of thorns. The nascent leaves are enveloped till the period of their expansion by a thick covering of cottony down, of a nankeen colour; but this is occasionally wanting. The unanimous testimony of the inhabitants of Praslin proves that each tree produces only one leaf a-year; and "as three leaves occupy about 8 inches of the trunk, and twenty years expire before that appears above the surface, a tree of eighty feet in height must be about four hundred years old." The flowers, about twenty in number, succeed each other one at a time, occasionally there are two together. The nuts are two-lobed, and sometimes two nuts are enclosed in one husk; three-lobed nuts are very rare, but some are met with, and it is said that specimens with five lobes have been found. The form of the nut is very singular, and cannot be compared with that of any other production of the vegetable kingdom. Two highly remarkable circumstances in the history of the Lodoicea are the duration of its blossoms and the period necessary for maturing its fruits; for the latter purpose seven or eight years are required. The Lodoicea grows in every variety of soil, but delights most in the vegetable mould of the deep gorges of the mountains. It is nevertheless found on the bare mountain tops, and forms a very conspicuous and remarkable object in such situations. It is curious that the vegetation of the nut should be prevented by its being buried, but if suffered simply to rest on the earth, in a situation not too much exposed to the sun, germination readily takes place. The purposes to which the produce of the Lodoicea is applied are numerous. The fruit, in its simple state, is an agreeable and refreshing aliment; when ripe it yields oil; its germ furnishes a very sweet food. Of the shell are made vessels of various shapes and sizes, that serve the Sechellois for nearly all domestic purposes. The entire nut is an article of commerce with India, where one of its uses is as an astringent medicine. The trunk is employed in building; split and hollowed it forms excellent gutters and paling; the leaf-stalks also are used for the latter purpose. The leaf forms a covering for roofs nearly as good as shingles, besides furnishing materials of a very superior description for hats, bonnets, wood-baskets and artificial flowers, in the manufacture of which many of the Sechelloises display great taste and skill. And lastly, the cottony down which covers the leaf previously to expansion, is a very good stuffing for pillows and mattresses.—*G. E. D.*